Analysis of Pesticide Related Illnesses to Mixer/Loader/Applicators in 1994 and 1998

Cal/EPA

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Introduction

- In 1995, the Federal Worker Protection Standard (WPS) was implemented in California.
- Full implementation of the WPS was accomplished in 1996.
- What has been the effect in California of the Federal WPS?

Method

- Years 1994 (pre-WPS) and 1998 (post-WPS) were selected for analysis. Tightest interval possible to reduce confounders.
- Mixer/loader/applicators (MLA) were selected as having the greatest exposure potential for both concentrate (mix/load) and application mixes (applicators).
- MLA exposures are usually the least ambiguous.

Method

- Pesticide Illness Surveillance Program database queried. Included illness classifications “Def/Poss/Prob”.
- In 1994 there were 129 cases; in 1998 there were 105.
- Cases with violations contributory to the illness/injury were removed, leaving 81 cases in 1994; 75 cases in 1998.

Method

Cases were reviewed and information was extracted for:

- Illness/Injury Type (Eye, Skin, Systemic)
- Associated Pesticide
- Regional Distribution
- Equipment/Procedural Associations
- Crop Use

Results

- Additionally, cases related to disinfectants, sanitizers (not agricultural/structural), and gaseous fumigants (not within purview of WPS) were also removed.
- Remaining cases:

1994	1998
72	62

Results

Illness/Injury Type:

EYE (irritation/redness/swelling/blurring) ***Overall Totals***	***20***	***18***
Goggles reported *WORN*	7	1
Goggles required but reported *OFF* [a]	0	4
Safety Glasses reported *WORN*	3	7
Face Shield reported *WORN*	3	4
Eye Protection not supposedly required [b]	7	2
SKIN (rash/chemical burn/dermatitis/itching) ***Overall Totals***	***26***	***24***
Established exposure route (skin not protected or material noted on skin)	10	7
Route unknown/unestablished [c]	16	17
SYSTEMIC (nausea/headache/breathing problems/vomiting/etc.) ***Overall Totals***	***26***	***20***
Established exposure route (noted odor and/or dermal exposure)	9	14
Route unknown/unestablished [c]	17	6

[a] Either had removed required goggles to rub eyes or had removed between ML operations.

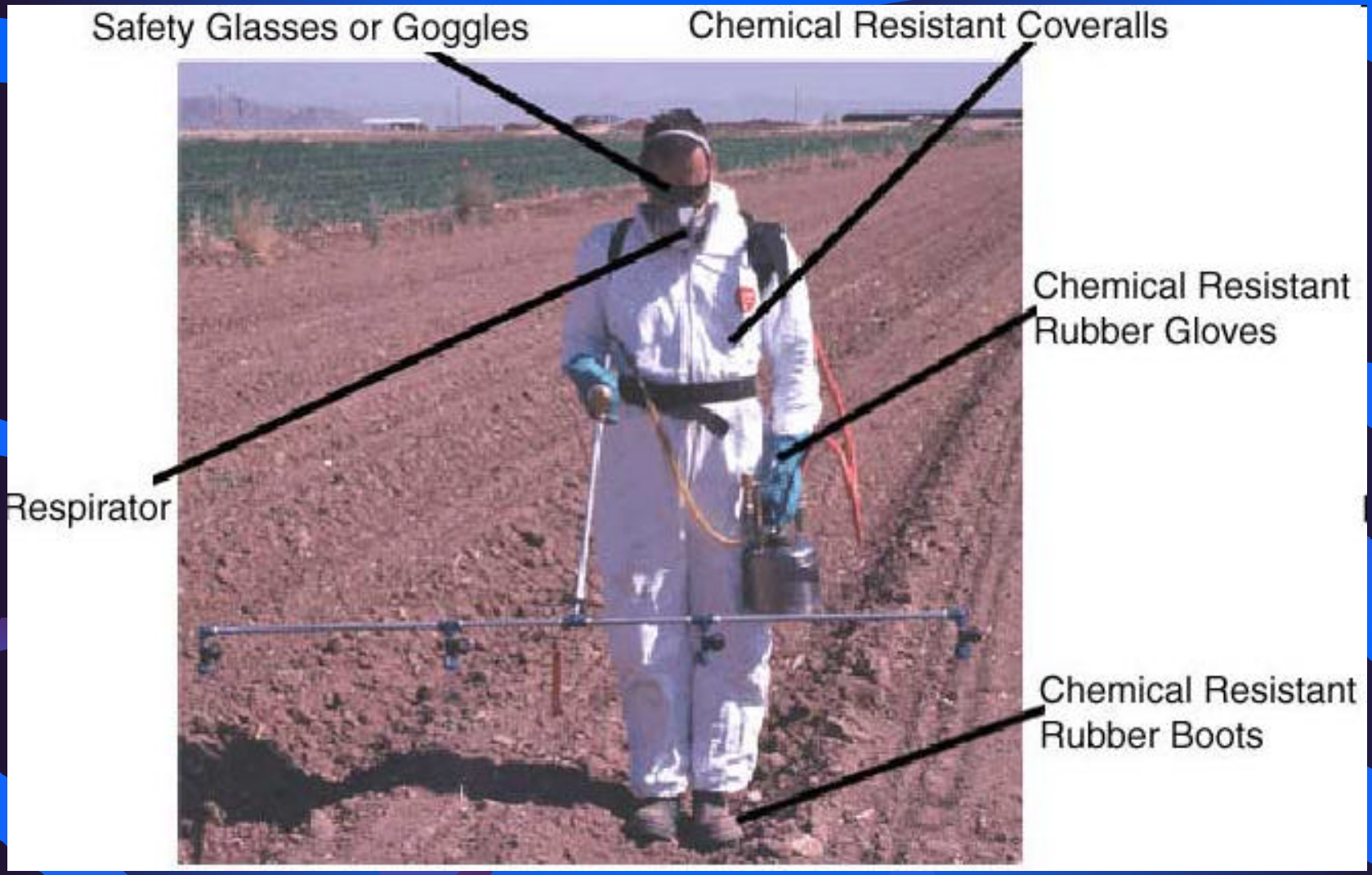
[b] Unclear from report as to whether eye protection was required.

[c] Worker could not identify route of exposure/did not recall any potential exposure event

Eye Protection

Brow and Temple Protection


Over Boot



All dressed up and nowhere to go.

Results

Pesticides Associated:

Pesticide	1994	1998
Glyphosate	6	11
Sulfur	5	5
Metam (Sodium or Potassium)	5	1
Propargite	5	1
Single Herbicide[a]	6	3
Multiple Herbicides[b]	7	5
Single OP or Carbamate (Cholinesterase Inhibitors)[a]	11	13
Multiple OP (Cholinesterase Inhibitors)[b]	7	4
Single Insecticides (Non-Cholinesterase Inhibitors)[a]	6	4
Single Fungicide[a]	5	1
Multiple Fungicides[b]	7	7
Multi OP/Fungicides/Herbicides[b]	0	6
Other (plant growth regulator, fumigant, antibiotic)	2	1
Total	72	62

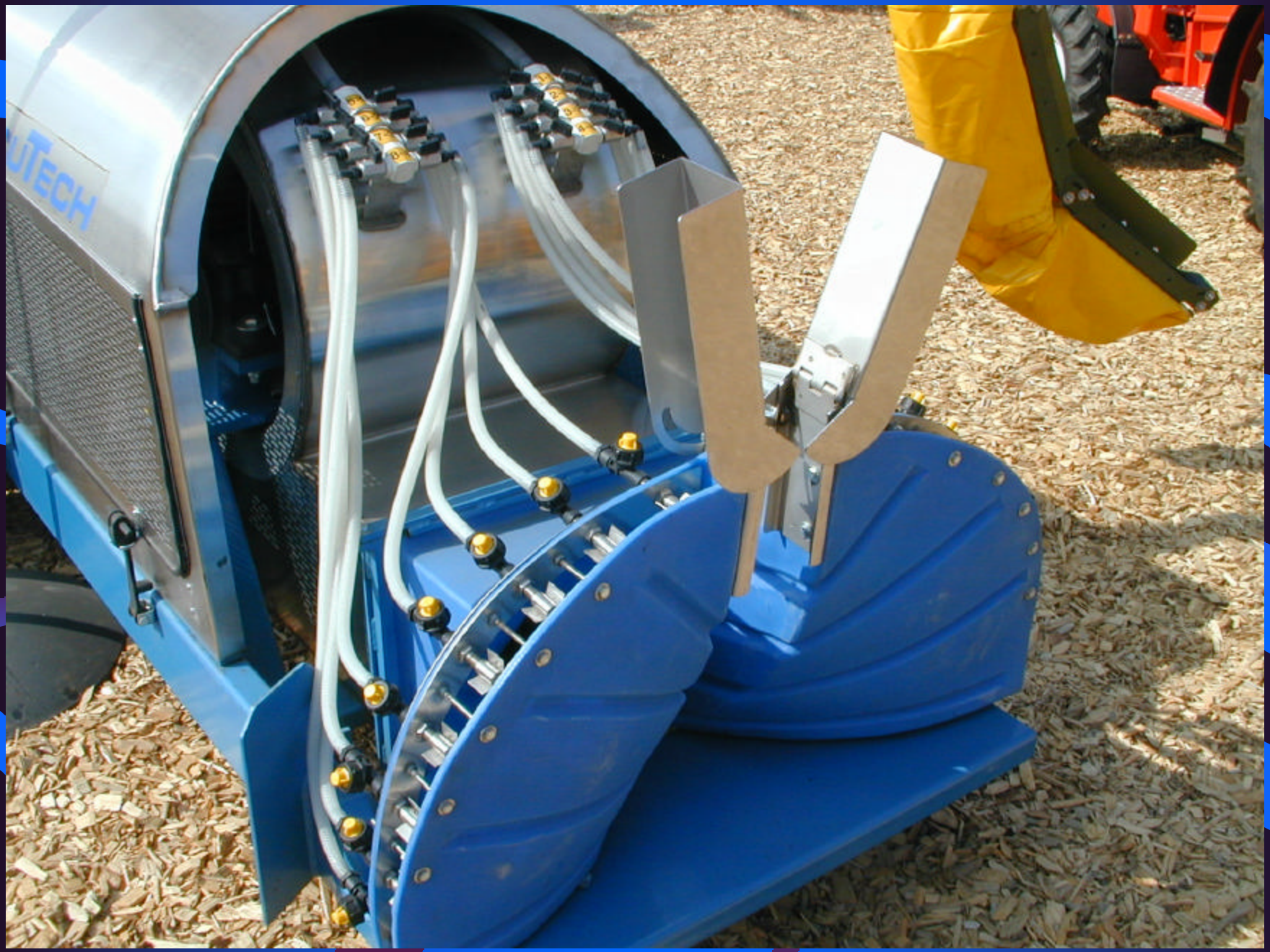
[a] tank mix contains single active ingredient

[b] tank mix contains more than one active ingredient

Results

Equipment/Procedure Associations:

Error/Procedural Failure Type	1994	1998
Operator Error/Procedural Failure	1	3
Equipment Failure: Hose Failure/Disconnect	6	8
Equipment Failure: Dropped Sprayer (excessively sensitive trigger)	0	1
Equipment Failure: Backpack Sprayer Vent Leak	0	2
Equipment Failure: Other Design Error	3	0
Equipment Failure: Leakage (nozzle/couplings)/Residual Pressure	1	2
Torn/Cut Water Soluble Bag	1	1
Airborne Particulates from Open/Agitated Bags	2	1
Totals	14	18




DEGANIA SPRAYERS


Parker
Parker

Results

Other Associations:

Regions with largest number of illness/injuries:

	1994	1998
San Joaquin Valley	48	48
Central Coast	8	10

Results

Other Associations:

Crop:

Number one is both years was grapes.

Number two in 1994 was tomatoes and in 1998 it was ornamentals.

Analysis

There was a slight decrease in all injury types from 1994 to 1998. Systemic illness experienced the greatest drop (23%).

However, within systemic illness, there was an increase in illnesses from known exposures versus a decrease in those from unknown routes of exposure.

Analysis

Eye injury associated with goggles dropped, though eye injury associated with ***required*** use of safety glasses increased.

Safety glasses are not as protective as tight fitting chemical resistant goggles. However, worker compliance with wearing safety glasses is usually higher than with goggles. In both cases, either is far superior to no eye protection at all.

Analysis

Injuries/illnesses attributed to equipment failure rose. These failure modes include:

Design Failures: sensitive handwands, missing gaskets, valve misassembly, vent hole leaks, explosions

System Failures: hose rupture, hose/handgun separation, clamp failure

Operator Error: failure to depressurize, dropped containers

Conclusions

It is difficult to discern any effect in California from the implementation of the federal WPS.

This may be because the established worker protection programs in California were providing equivalent or better guidance for worker health and safety.

General reduction in MLA illness/injury may be more related to improvements in equipment, increased PPE use compliance, and better handler training.

Recommendations

1. Compliance and consultation outreach programs to ensure proper and safe use of equipment and PPE.

2. Focused inspection of MLA equipment, stressing preventive maintenance and intrinsic safety of design.

3. Provide CAC with continuing education on proper PPE selection, use and limitations.

Improper PPE use

Correct Fit Check Procedures

Additional Information

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